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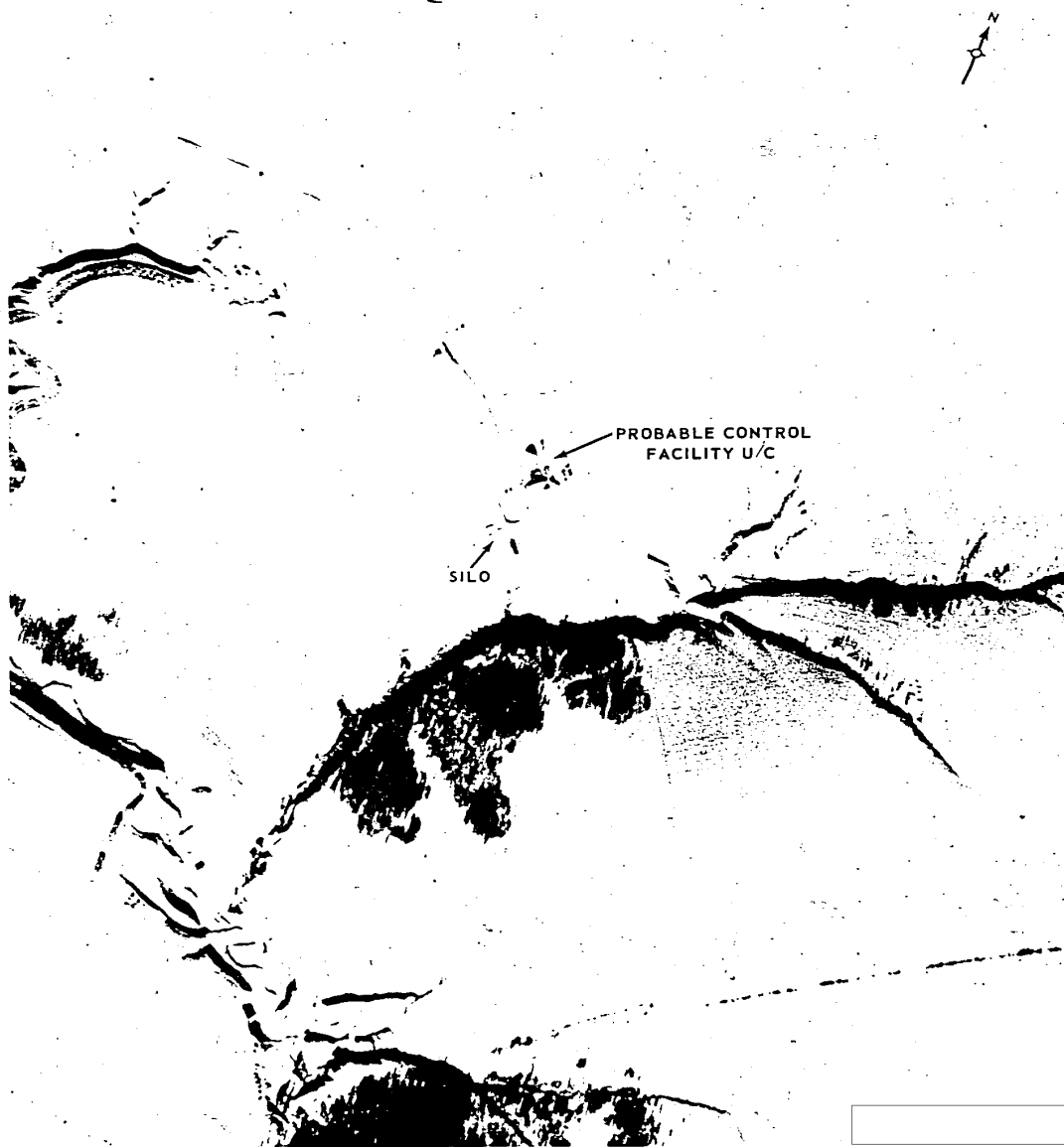


FIGURE 28. LAUNCH SITE A1-1, LAUNCH GROUP A, TATISHCHEVO ICBM COMPLEX.

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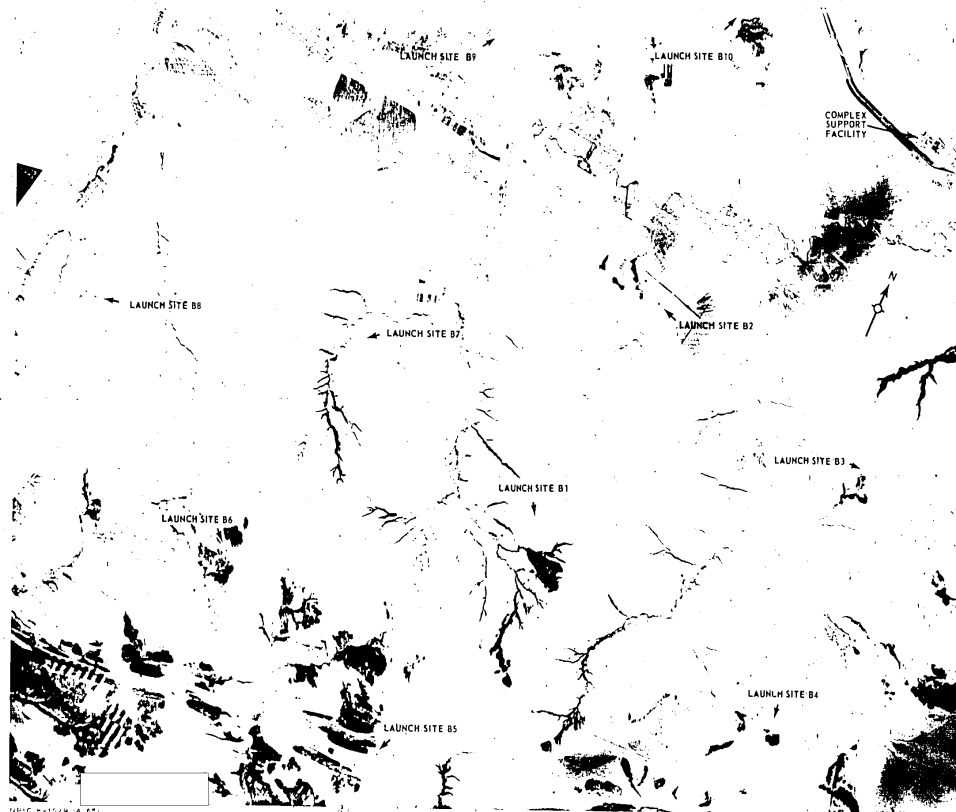


FIGURE 29. LAUNCH GROUP B(12-21), TATISHCHEVO ICBM COMPLEX.

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FIGURE 30. LAUNCH GROUP G/7-16, DROVYANAYA ICBM COMPLEX.

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FIGURE 31. 'LAUNCH GROUP F7-13', GLADKAYA ICBM COMPLEX.

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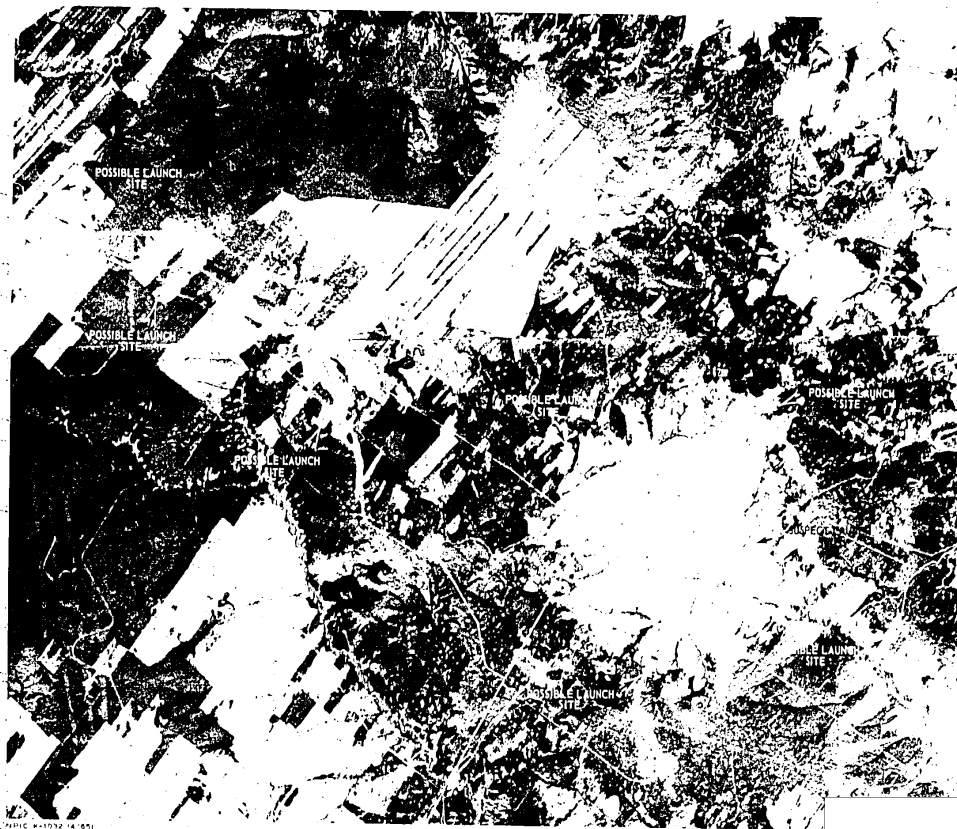


FIGURE 32. POSSIBLE LAUNCH GROUP G, PERM ICBM COMPLEX.

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25X1**Associated Missile Systems**

We have examined all available evidence in an attempt to determine specifically the missile systems associated with the 2 types of single-silo configurations identified at Tyuratam and currently under construction at deployed sites. Our analysis included detailed study of both types of sites at the rangehead and in the field, assessment of the flight test programs of the SS-9 and SS-10, examination of new launch facilities (other than single-silo types) at Tyuratam, and the time relationship between flight test programs and site construction. The result of this analysis shows that present evidence is insufficient to permit a definite assignment of missile systems to single silos.

**PACE AND EXTENT OF ICBM DEPLOYMENT**

It is apparent that the Soviets have designed their single-silo deployment program to increase significantly the total number of operational ICBM launchers and reduce site vulnerability through dispersion and hardening. It is still too early to determine whether the Soviets intend to increase the credibility of their deterrent force by the addition of a significant, but relatively limited, number of launchers in a comparatively short period of time; whether the rate and pace of new construction noted in 1964 will continue for the next several years; or whether the single-silo deployment program is designed to eventually match the US in numbers. This judgment cannot be made with any degree of confidence until we can identify the missile systems to be deployed in single silos; determine with greater confidence the number currently under construction, and observe the rate of construction starts subsequent to completion of the silos begun during 1964. Succeeding paragraphs present our analysis of existing evidence relating to the pace and ex-

tent of the single-silo deployment program.

Construction of all of the nearly 100 identified launchers which are currently under construction at deployed complexes (including 4 probable soft pads at Plesetsk) was probably initiated during calendar year 1964, and there are probably other sites begun prior to 1965 which have not yet been detected. The nearly 100 identified construction starts exceed by some 10 launchers the previous high total for a single year achieved in 1962.

In terms of sustained construction activity, the total of almost 100 launchers concurrently under construction does not approach the previous high of 140 launchers achieved in mid-1963. This could be significant in light of the gap in site construction starts which occurred during the last several months of 1963, and the obvious availability of construction crews and equipment from halted ICBM, IRBM, and MRBM programs. Furthermore, construction activity in the field is proceeding at a sustained but deliberate pace, particularly at the Type IIC complexes.

In summary, while the current ICBM deployment program is characterized by a launcher deployment rate somewhat higher than that of previous years, it appears to be less than a maximum effort and is progressing at a sustained but deliberate pace. We expect that construction of new sites at identified complexes will continue and that additional complexes will be constructed to accommodate deployment of third and possibly fourth generation missile systems.

**STATUS OF OLDER SYSTEMS****General**

In light of the significant deployment of single-silo configurations at both old and new ICBM complexes, we have examined sites as-

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sociated with first and second generation ICBM systems for evidence of change or modification which might indicate a change in operational status. In particular, we searched for evidence that sites employing older systems are being deactivated or modified to accept newer missiles currently under development. A summary of our findings is presented in succeeding paragraphs.

#### SS-6 Sites

The SS-6 missile continues to be deployed at only 4 launchers at the Plesetsk Complex. These sites are active and there is no evidence of construction activity which might indicate replacement of the SS-6 system at this complex with a follow-on system.

We cannot identify any ICBM system currently operational or under flight test which might be compatible with SS-6 launch facilities. If retrofit were intended for these launchers, we would expect to see such retrofit preceded by firing of the new system from SS-6 facilities at Tyuratam. No such firings have been detected. We expect, however, that the SS-6 system will be phased out of the inventory when a more sophisticated system with equivalent or greater payload capacity becomes operational.

#### SS-7 Sites

##### CURRENT STATUS

Construction starts for SS-7 soft and hard sites terminated in September 1963. Furthermore, 1 soft site and 4 hard sites, ranging in construction status from early to midstage, were abandoned in late 1963 and early 1964. One hard site, Yedrovo Launch Site H(9), belonged to the original group of 15 Type IIIA sites begun prior to July 1962. Begun about March 1962, this site was abandoned about September 1963, after having reached a mid-stage of construction. The other 3 abandoned hard sites, Gladkaya Launch Sites C(4) and

E(6) and Kostroma Launch Site H(8), belong to the second group of 12 Type IIIA sites begun during the period April to September 1963. All 3 were abandoned early in 1964, concurrent with the initiation of construction of the first single-silo sites. Construction of the abandoned Launch Site G(7) at Teykovo, a Type IID soft site, ceased in fall of 1963 while the site was in a very early construction stage.

We have still been unable to detect any significant difference between the first and second groups of Type IIIA hard sites deployed in the field.

2 groups. This feature, however, is probably related to improved handling procedures rather than a new or modified missile system.

In previous revisions we have surmised that the second group of Type IIIA hard sites may be intended for the SS-9 rather than the SS-7. We based this postulation primarily on test range evidence associating Launch Site D2(9) at Tyuratam with the SS-9 missile system, since we could see no significant external differences between the 2 groups of Type IIIA sites in the field, or between Launch Sites D1(4) and D2(9) at the rangehead. We had expected that the L-shaped guidance facility associated with Launch Site D2(9) at Tyuratam would also appear in the field. To date, we have been able to identify a possible electronic facility at only 1 site, Launch Site B(2) at Olovyannaya. This suspect area consists of an L-shaped ground scar approximately 1,700 by 1,300 feet, located to the rear of the launch site (Figure 33). It can be negated in September 1964. No construction activity is visible in the scarred area, and we cannot confirm or deny its association with

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guidance at this time. We are particularly reluctant to make an early judgment in this respect for 2 reasons: similar scars cannot be identified at any of the other 8 sites in this category; and an L-shaped ground scar has existed for some time at Launch Site B(2) at Shadrinsk (Figure 34), an early Type IIIA site begun late in 1961 and completed about January 1964. We do not believe that the scar at Shadrinsk is related to a ground-based guidance facility.

If the sites in the second group of Type IIIA hard sites are not provided a ground-based guidance facility, the obvious conclusion is that the associated missile system utilizes all-inertial guidance. The SS-7 missile utilizes an all-inertial guidance scheme and no guidance facilities have been observed at sites firmly associated with this system. While flight tests of the newer SS-9 missile indicate that it uses a radio-guidance link, we believe that it, like the SS-7, can be flown in an all-inertial mode without the requirement for a ground-based guidance link. In summary, while we are unable to determine firmly whether the later group of Type IIIA sites is for the SS-9, we believe that this is the most likely possibility.

Total deployment of site configurations identified with the SS-7 missile system consists of 64 soft sites (128 launchers) and 23 hard sites (69 silos) distributed among 15 complexes. All are currently operational. The later group of 9 Type IIIA hard sites was constructed in from 17 to 20 months, a significant decrease in construction time over the first group of 14, which required an average of 22 to 24 months to build.

#### RETROFIT

We can find no evidence that SS-7 sites are being modified to accept a new missile system.

We believe that this change is related to retrofit of early SS-7 warheads/nose-cones with later variations.

We believe, however, that the SS-9 missile can be accommodated in launch facilities at deployed complexes currently associated with the SS-7. A variety of evidence indicates that the SS-9 has been fired from SS-7 facilities at Tyuratam. We cannot determine, however, the extent of modifications required to permit compatibility of the 2 systems.

The best photographic evidence that SS-7 sites were being retrofitted for the SS-9 would be the construction of ground-based guidance facilities similar to the L's at Launch Sites D2(9) and H(8) at Tyuratam. No evidence of such facilities can be identified on available photography. However, we cannot exclude the possibility that the SS-9 will be deployed in an all-inertial mode with no requirement for ground-based guidance.

We believe that our chances of detecting retrofit of the SS-9 missile at Type IIA and IIB soft sites would be better than at the later Type IID version, or at the Type IIIA hard sites. We base this belief on the fact that the SS-9 utilizes nitrogen tetroxide as an oxidizer.  $N_2O_4$  is temperature-sensitive and requires storage facilities offering environmental protection. We have firm evidence that Type IIA and IIB soft sites, unlike the other 2 deployment configurations, utilize mobile propellant-loading equipment. Thus we would expect to see installation of fuel storage facilities in the immediate launch pad area in conjunction with any retrofit program.

We believe that Type IID soft sites and Type IIIA hard sites can be retrofitted for an SS-9 employing all-inertial guidance without detection based on outward change or modifica-

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tion of site facilities. Such modification did take place at Launch Site C(3) and D1(4) at Tyuratam without photographic evidence of change.

While we recognize the possibility that some SS-7 launchers may be retrofitted with the SS-9, we do not expect to see such a program occur at an early date. We base this judgment on the continued utility of the SS-7 system against many ICBM targets, the relatively large number of these missiles estimated to be in the inventory, and the apparent intent of the Soviets to accomplish a significant increase in the total number of operational launchers.

#### SS-8 Sites

##### CURRENT STATUS

Construction starts for SS-8 sites, both soft and hard, ceased in the summer of 1962. Four soft and 2 hard sites, all in early stages of construction, were abandoned and the Gladkaya Complex was converted to the SS-7 system beginning in September 1962. The SS-8 system is currently deployed in 7 soft and 3 hard sites at 4 complexes in the USSR. The 23 launchers associated with this system are all operational.

##### RETROFIT

We can detect no activity at deployed SS-8 sites indicative of retrofit with a newer system. As is the case for the SS-6, we would expect retrofit of SS-8 test facilities and firings of the new system from these launchers Tyuratam to precede changes at deployed sites. There is evidence that a rail spur is being constructed to service Launch Site E(6) at Tyuratam. It is too early to determine, however, whether rail service to this facility is associated with a new missile system. In any event, no firings of missiles other than the SS-8 have been detected from Launch Sites E(6) and F(5) at the test center.

There is no evidence that the SS-10 has been fired from facilities other than Launch Site G1/G2(7) at Tyuratam, nor do we know the missile size or characteristics with any degree of confidence. Therefore we cannot determine the possibility of employment of this system at existing SS-8 sites.

However, we believe that SS-8 missiles at deployed sites may be phased out during the next several years, because maintenance of the few sites deployed will become less desirable as more sophisticated missile systems become operational.

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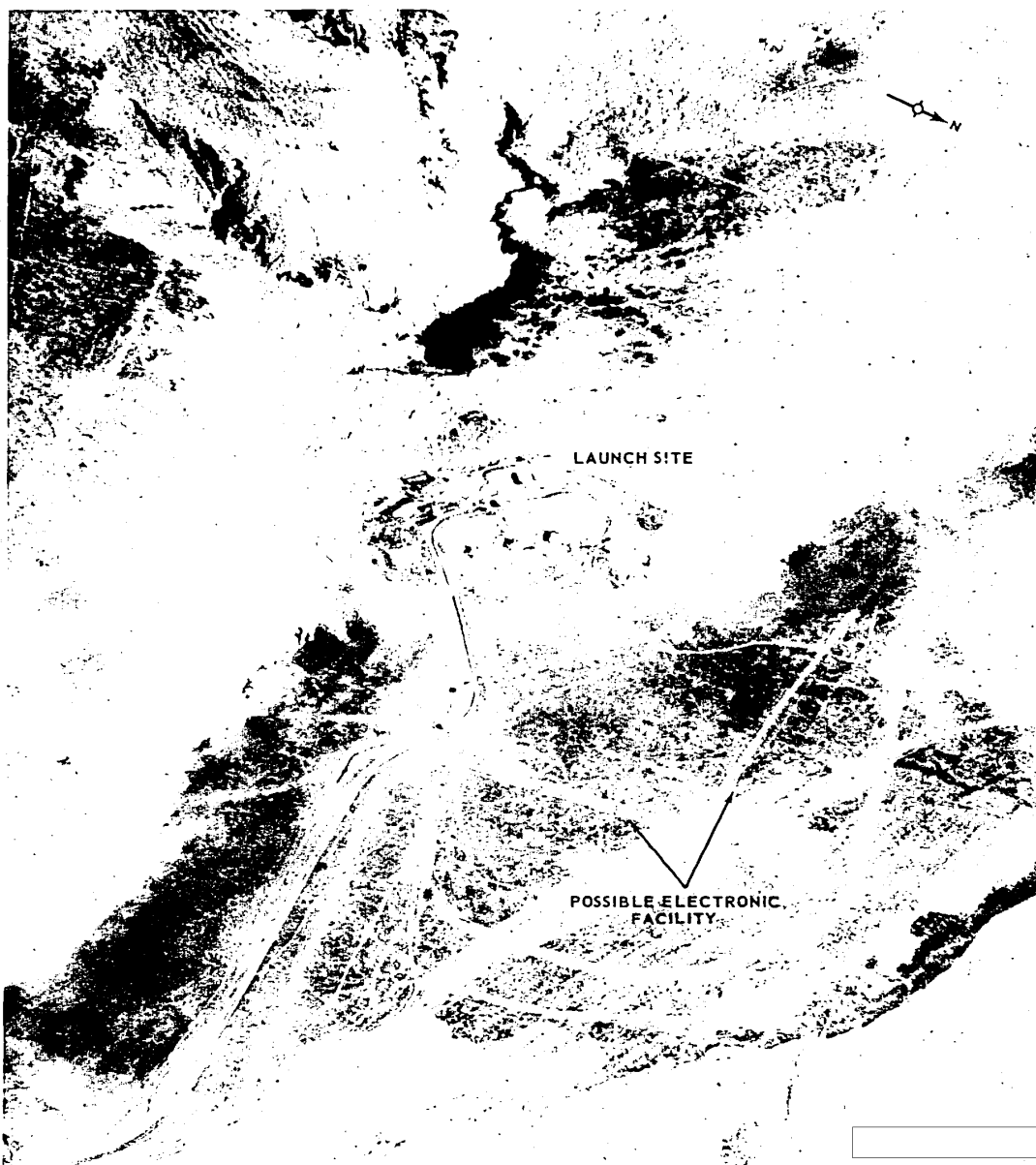


FIGURE 33. POSSIBLE ELECTRONIC FACILITY, LAUNCH SITE B(2), OLOVYANNAYA ICBM COMPLEX.

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FIGURE 34. L-SHAPED GROUND SCAR, LAUNCH SITE B(2), SHADRINSK ICBM COMPLEX.

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## TYURATAM MISSILE TEST CENTER

## Test Range Facilities

Tyuratam is covered by poor-to-fair quality photography [ ] in January 1965. Highlight of this coverage is the discovery of Launch Site K3(20), a Type IHD single silo located near the previously identified interferometer at Complex K(13).

No significant change is visible at the 3 launch sites at Launch Complex A. A line drawing of Launch Site A3(15) is depicted in Figure 5.

No significant change has occurred at Launch Site B1(2). At Launch Site B2(16), no change in the silo can be discerned (Figure 6), but a 150-foot-long building has been constructed near the terminus of a road first identified [ ] in September 1964. At Launch Site B3(17), a dome-like object approximately 50 feet in diameter is located in the center of the pad. No other change is apparent at this facility [ ] in September 1964. An artist's concept of Launch Site B3(17) is shown in Figure 35.

No apparent changes in facilities can be discerned at Launch Complexes C(3), D(4), E(6), and F(5) since our last revision.

No change or significant activity is apparent at Launch Site G1/G2(7). An artist's concept of this launch facility is shown in Figure 36. [ ] in January 1965 shows a rail car approximately 100 feet long on the rail spur serving Pad G4 at Launch Site G3/G4(11). In addition, there are 4 rail cars, each approximately 40 feet long, on the rail spur leading east of Pad G4. An artist's concept of the site is shown in Figure 37.

[ ] January 1965 both show the single gantry at Launch Site G5/G6(12) on Pad G6. The quality of the photography precludes a determination of whether or not a missile is in the gantry. [ ]

[ ] there is a vehicle on the pad near the gantry and 2 vehicles, each about 45 feet in length, are in front of the earth-mounded building on the right side of the center road. A line drawing and an artist's concept of this launch facility are shown in Figures 38 and 39. Construction continues at Launch Site G7(18), shown in Figure 8. The silo extends upward from the base of the excavation but is probably not up to ground level. The ditching is still open along the segments of the L-shaped electronic facility and the probable control bunker near the vertex of the L has not yet been backfilled. At Launch Site G8/G9(19), [ ] shows activity at both aprons surrounding the silos, and both silos may be open. The site apparently remains in a late stage of construction. An artist's concept of this launch facility is shown in Figure 21.

No apparent activity or change in facilities is visible at Launch Complex H(8) since our last revision.

[ ] in January 1965 shows that construction at the single-silo launch site is continuing at Launch Complex I(14), but darkness precludes detailed interpretation. A line drawing of this site is depicted in Figure 7.

Launch Complex J is covered [ ] in January 1965. This photography (Figure 40) shows that the focal point of activity is the large excavation first visible on [ ] in October 1964. The excavation is 2.9 nm north-northwest of Launch Site A1(1) and is the first firm indication of the location of a future launch position. The excavation is now hexagonal in shape with 2 earth cuts leading into the pit. There appear to be at least 3 levels within the excavation, but the bottom is obscured by darkness. The distance across the lowest level measures approximately 260 feet. Construction continues

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on the massive 800- by 615-foot building east of the support facility. The low section, approximately 230 feet wide, is now completely roofed and roofing has started on the higher section. The rail embankment parallel to the main road has been extended to the point where the road curves toward the large excavation.

[ ] in January 1965 and comparative review of previous coverage of Launch Complex K(13) revealed a newly identified single silo in a late stage of construction within the secured area containing the L-shaped electronic facility. This silo and its associated interferometer have been designated Launch Site K3(20). The silo can first be identified under construction [ ] in June 1964 and apparently can be negated [ ]

[ ] in February 1964, although the area was snow covered on that photography. Silo imagery and construction techniques appear the same as the silos at Launch Site G8/G9 (19), but the site signature is not the same. It closely resembles the center sites at Type IICD launch groups at the Tatishchevo and Olovyanaya Complexes. A line drawing and an artist's concept of this launch facility are

shown in Figures 19 and 20. Construction continues at Launch Sites K1 and K2(13), which are depicted in Figure 9. Both silos extend upward from the base of their respective excavations, but neither appears to be up to ground level. Both have ramps extending across the excavations to the silos. Back-filling is not apparent and ditching, first identified [ ] in November 1964 and reported in our 16th Revision, is visible leading from these sites to Launch Site G7(18).

#### Test Range Activity

During the period [ ] only 2 successful ICBM operations were noted at the Tyuratam Missile Test Range. [ ] an SS-7 missile was launched to the Kamchatka Impact Area, and [ ] an SS-9 was fired 7,000 nm to a preannounced extended impact area in the Central Pacific. In addition, [ ] an SS-9 missile experienced an early in-flight failure during an operation involving the extended-range Pacific Impact Area. Canceled ICBM operations were recorded [ ]

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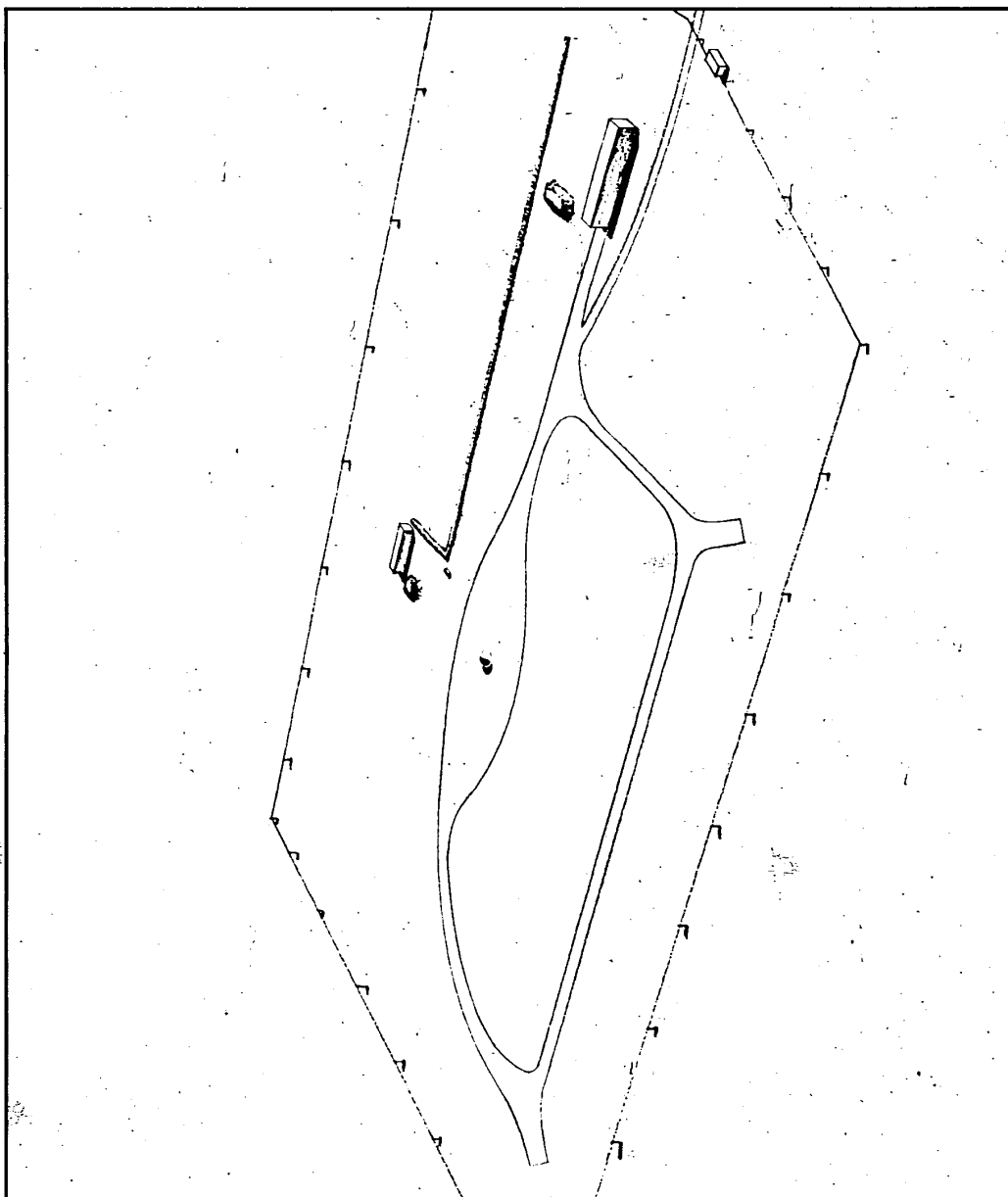


FIGURE 35. ARTIST'S CONCEPT OF LAUNCH SITE B3(17), TYURATAM.

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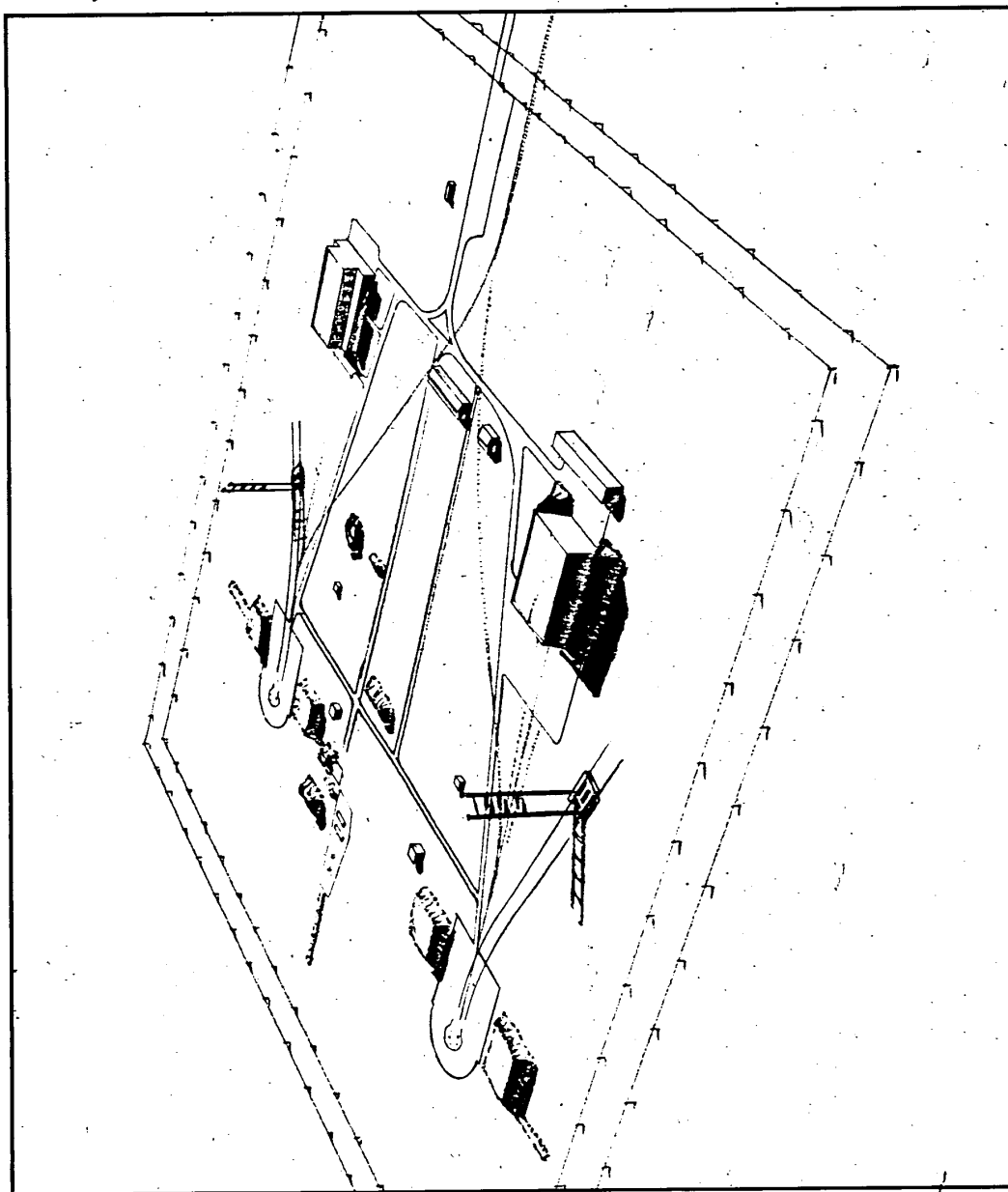


FIGURE 36. ARTIST'S CONCEPT OF LAUNCH SITE G1 G271, TYURATAM.

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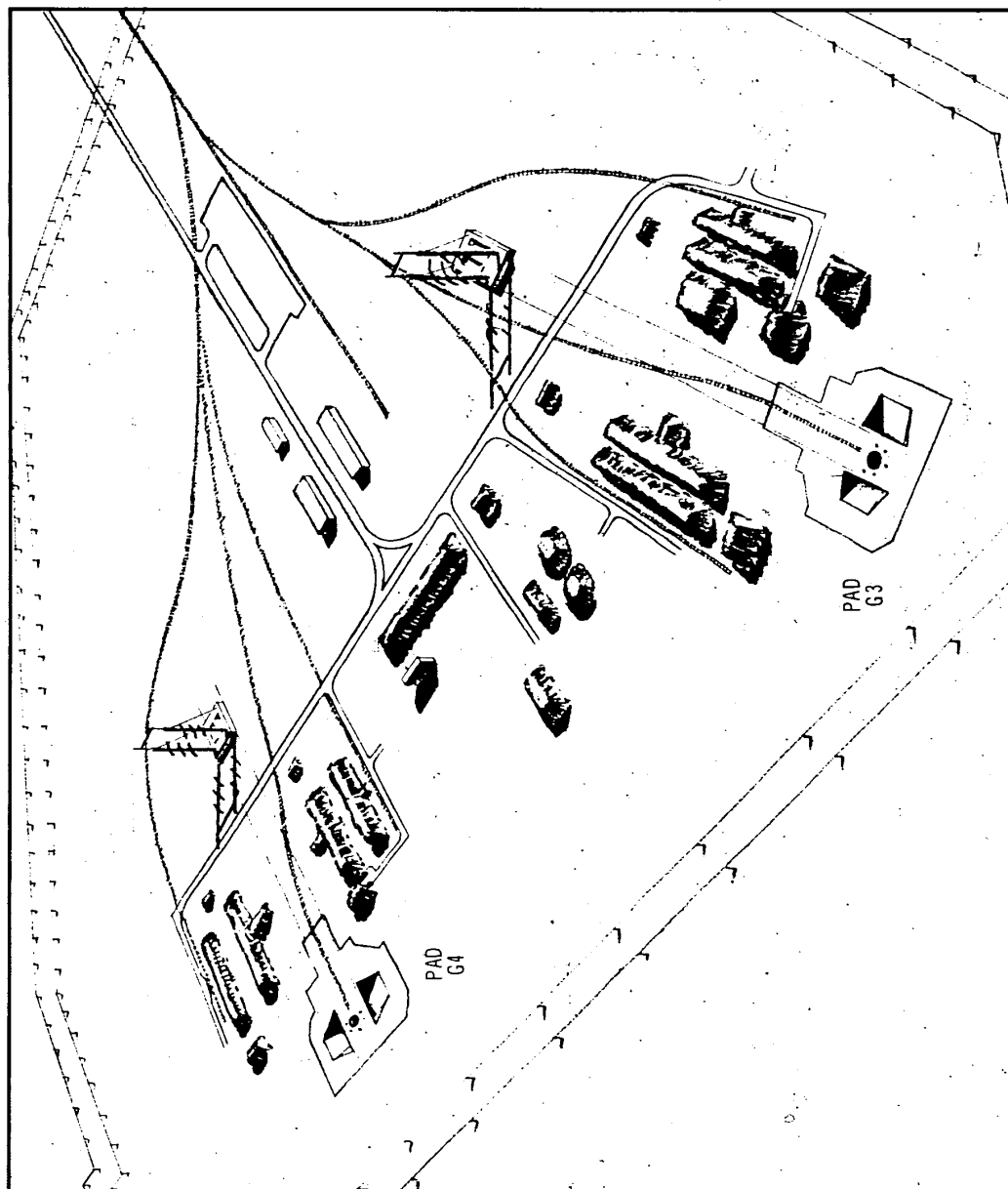


FIGURE 37. ARTIST'S CONCEPT OF LAUNCH SITE G3 (G4(11), TYURATAM.

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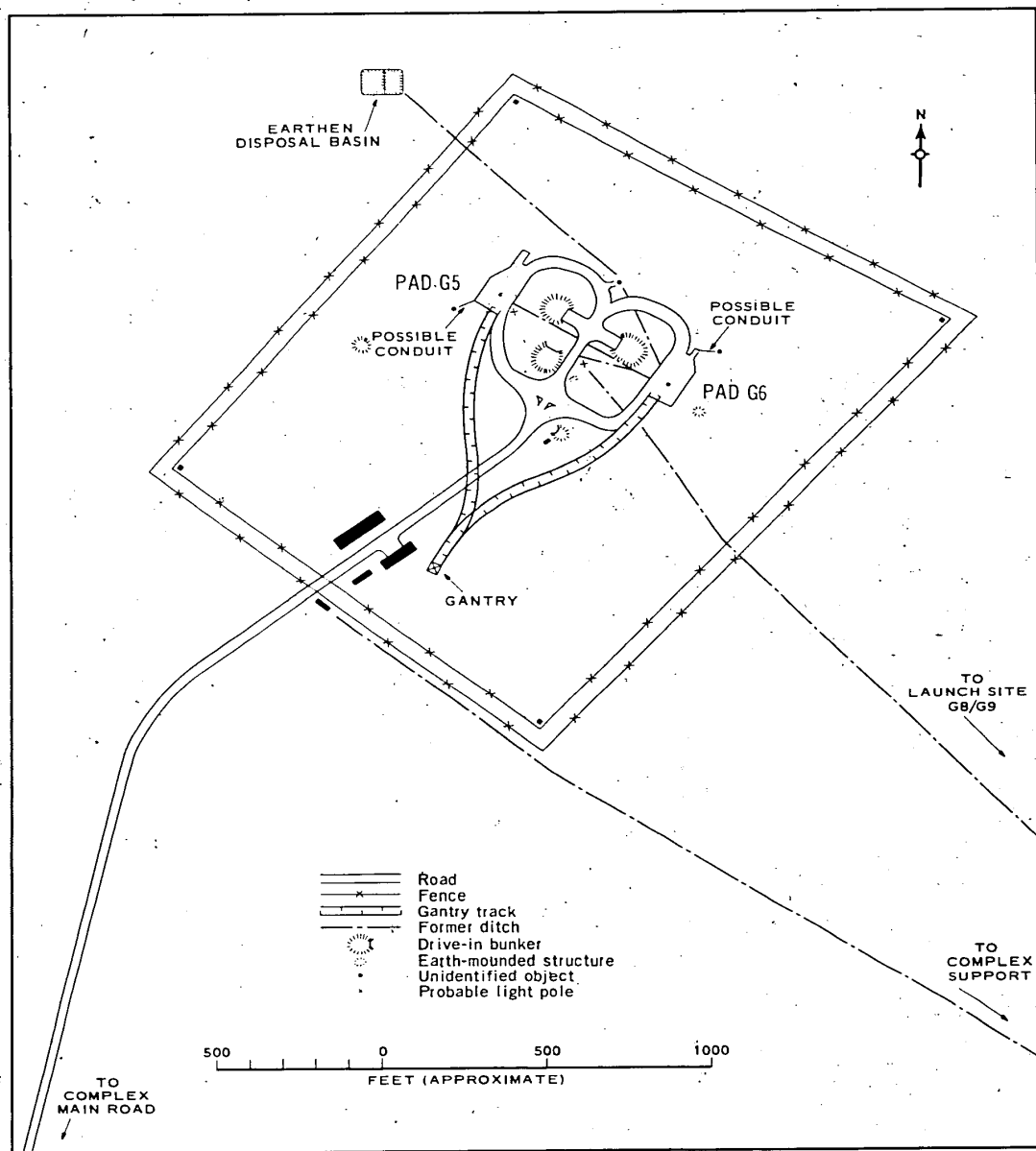
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FIGURE 38. LAUNCH SITE G5 G6/G12, TYURATAM.

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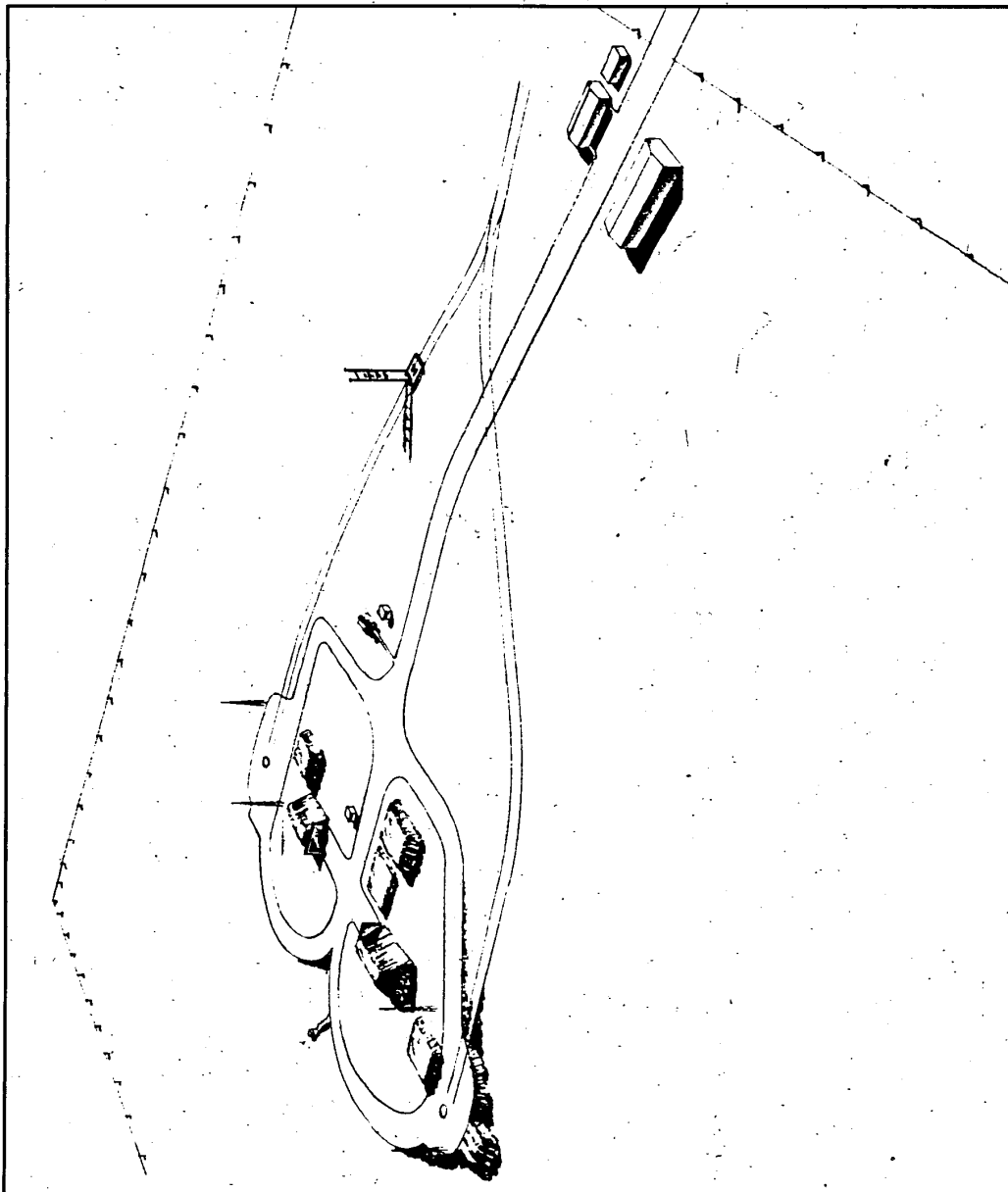


FIGURE 39. ARTIST'S CONCEPT OF LAUNCH SITE G5 G612, TYURATAM.

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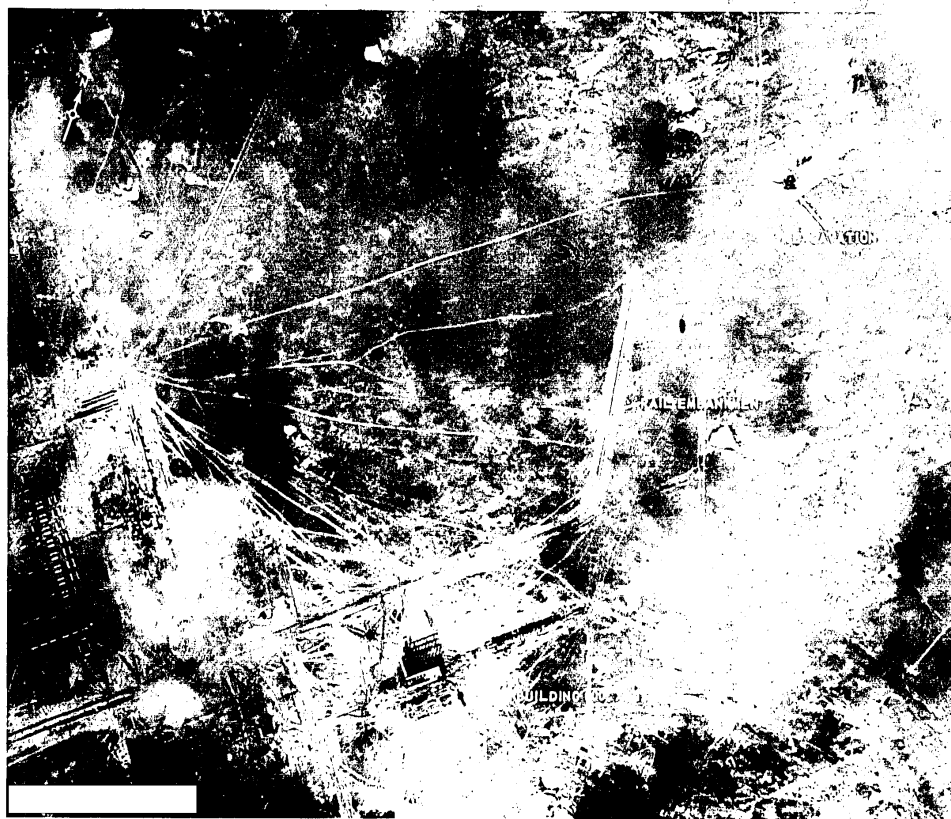
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FIGURE 40. LAUNCH COMPLEX J, TYURATAM.

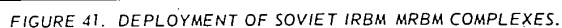
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**SOVIET IRBM/MRBM DEPLOYMENT**

KEYHOLE photography since our 16th Revision covers 9 of the 14 IRBM, and 17 of the 68 MRBM complexes. One MRBM soft site has been abandoned, one IRBM soft site, previously carried in our tables as having 4 launchers, appears to have only 2, and 1 additional fixed field site has been added to the inventory. These changes are reflected in Tables 3, 4, 5, 6, and 7. Information on surface-to-surface launch sites at the Kapustin Yar Missile Test Center has been added as Table 5. Locations of deployed IRBM/MRBM complexes are shown in Figure 41. Typical configurations of the launch sites and the weapons system associated with each are depicted in Figure 42. The composition of IRBM/MRBM complexes is given in Table 7.

**IRBM DEPLOYMENT  
Current Force Level**

The Soviet IRBM force currently consists of 33 sites containing a total of 112 launchers, including 54 in a hard configuration.\* Of these launchers, 109, including 51 silos, are estimated to be operational. These figures represent an overall reduction of 2 soft launchers from those carried in our 16th Revision. This reduction is explained in succeeding paragraphs.

**Bereza IRBM Launch Site**

Good quality coverage of the Krolevert IRBM Complex [ ] in January 1965 revealed that only 2 pads at the Bereza Launch Site are complete and operational (Figure 43). Only 2 missile-ready buildings and 1 control bunker are visible compared to 4 and 2, respectively, at a normal Type III site. This site, first covered [ ] in July 1963, is in a heavily wooded area and the

\*One member currently carries 45 sites; Novosyoyevka 3 and Karakhobla are not considered abandoned.

January 1965 photography is the first good coverage obtained. As a result of this evidence, we are dropping 2 launchers from the IRBM inventory and are currently reviewing available photography of other IRBM/MRBM soft launch sites to determine their current operational status.

**MRBM DEPLOYMENT  
Current Deployment**

The Soviet MRBM force currently consists of 157 sites containing 628 launchers, including 84 in a hard configuration. All are operational. These figures represent an overall reduction of 4 launchers from those carried in our 16th Revision and reflect the inactivation of a soft site at Rozhdestvenka.

**Anastasyevka Launch Site 2**

[ ] in January 1965 permitted identification of 4 nosecone vans [ ]

This is the first time that nosecone vans have been firmly identified on KEYHOLE photography of the USSR. [ ]

[ ] These measurements compare favorably with the mensuration of nosecone vans associated with Soviet MRBM deployment in Cuba (Figure 45).

**Fixed Field Sites**

One additional fixed field site has been identified on KEYHOLE photography since our 16th Revision, bringing the total identified to date to 72. A list of these sites is given in Table 6. The new site (Figure 46) is associated with the Akhtyrka MRBM Complex and has 4 launch positions. It was present on [ ] in April 1962, but cannot be negated.

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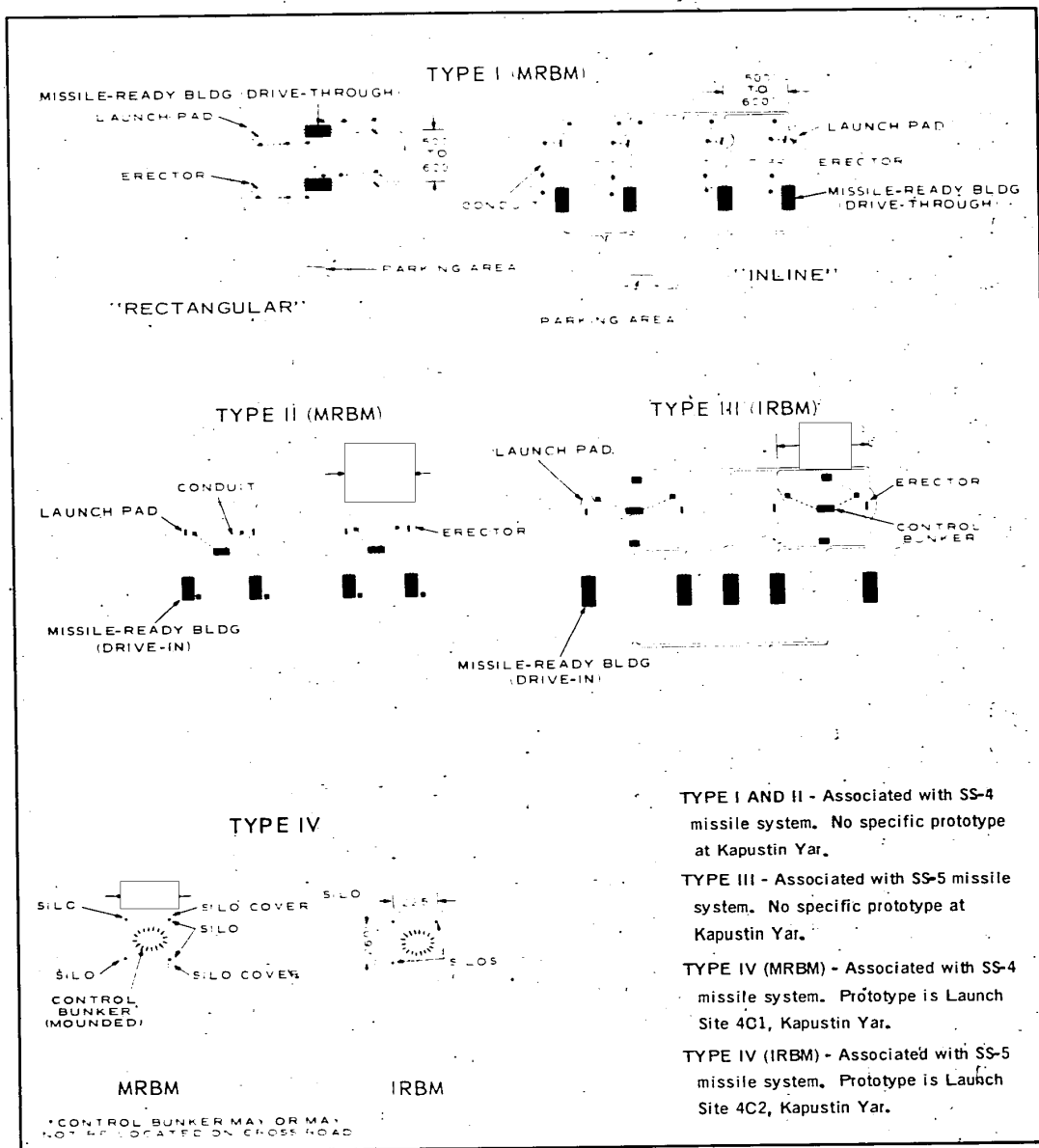


FIGURE 42. TYPICAL CONFIGURATIONS OF IRBM MRBM LAUNCH SITES, WITH ASSOCIATED MISSILE SYSTEMS.

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## SITES WITHOUT SUPPORT FACILITIES

[redacted] in January 1965 reveals that the Rozhdestvenka MRBM soft site has probably been inactivated and we are dropping it from our tables. The site appears inactive on this KH-7 photography, and no snow removal is apparent (Figure 47). All structures at the site appear unused and irregular in outline, and the missile-ready building to the rear of the northernmost pad is either badly deteriorated or has been partly removed. Three buildings have been removed [redacted] in March 1964. Some 60 tent bases are visible approximately 1,000 feet west of the technical section and numerous personnel and vehicle revetments can be identified in wooded areas surrounding the site. We believe this activity is associated with troop training for units stationed at the extensive military installations in and near Iman.

The Rozhdestvenka site was 1 of 9 singly deployed IRBM/MRBM soft sites, mostly constructed during 1962, which were uniquely lacking the usual administration and housing facilities. In addition to Rozhdestvenka, this group included IRBM sites at Bayram-Ali, Ramoye, Traktovyy, and Zhuravka; and MRBM launch facilities at Kraskino, Marina Gorka, Sledyuki, and Uzhgorod. In our 16th Revision we noted that the Bayram-Ali site had been abandoned and that dismantling operations might be underway at Traktovyy and Zhuravka. Since that time we have observed only Rozhdestvenka and Zhuravka. At the latter, no further dismantling can be observed but we cannot determine the current operational status of the site. Pending further coverage, we are

continuing to carry the remaining 7 sites as part of the operational inventory.

KAPUSTIN YAR MISSILE TEST CENTER  
Test Range Facilities

The Kapustin Yar Missile Test Center is covered by clear photography [redacted] in December 1964 and [redacted] in January 1965. The highlight of the coverage--in fact the only significant development since the 16th Revision--is the identification of Launch Complex H, a new surface-to-surface launch facility, approximately 2.5nm north-northeast of Launch Complex E. The new facility is still under construction (Figure 48) and consists of a fenced, road-served, launch area approximately 735 by 620 feet, containing 2 soft launch pads and a probable control bunker. Pad separation is about 495 feet and site orientation [redacted]

The probable control bunker is identifiable in an early construction stage [redacted] in September 1964. One pad was newly under construction [redacted] in November 1964, and the other was probably begun shortly thereafter. We cannot determine the purpose of this launch facility at the present time.

## Test Range Activity

During the period covered by this revision there were firings of probable SS-4 vehicles to the G area of the Kapustin Yar Missile Test Range [redacted] and 2 firings of probable SS-4 missiles to the G area [redacted]

[redacted] there were probable SS-5 firings to the 2,000-nm impact area.

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FIGURE 43. BEREZA IRBM LAUNCH SITE.

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FIGURE 44: NOSECONE VANS AT ANASTASYEVKA LAUNCH SITE 2.

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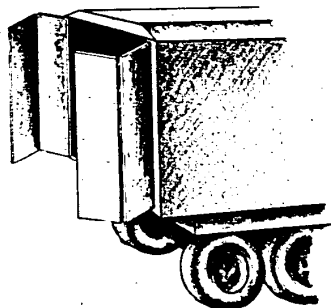
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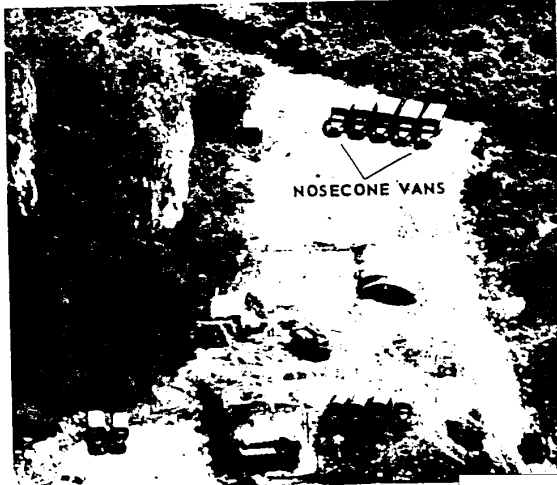
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SKETCH OF NOSECONE VAN  
REAR DOORS



NOSECONE VANS

SAGUA LA GRANDE MRBM LAUNCH SITE 2.

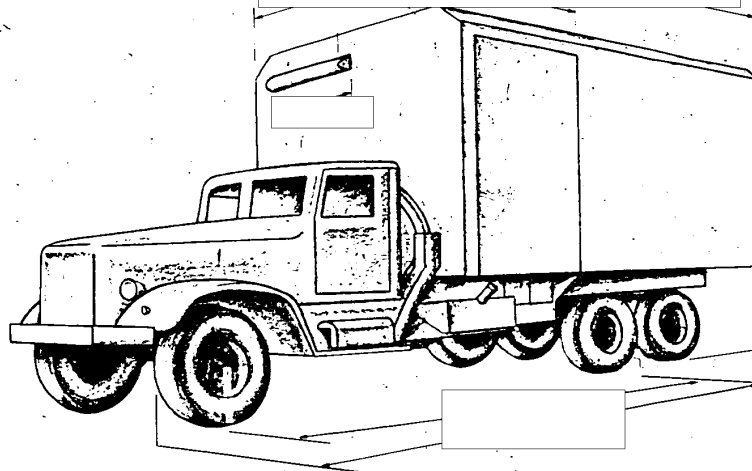
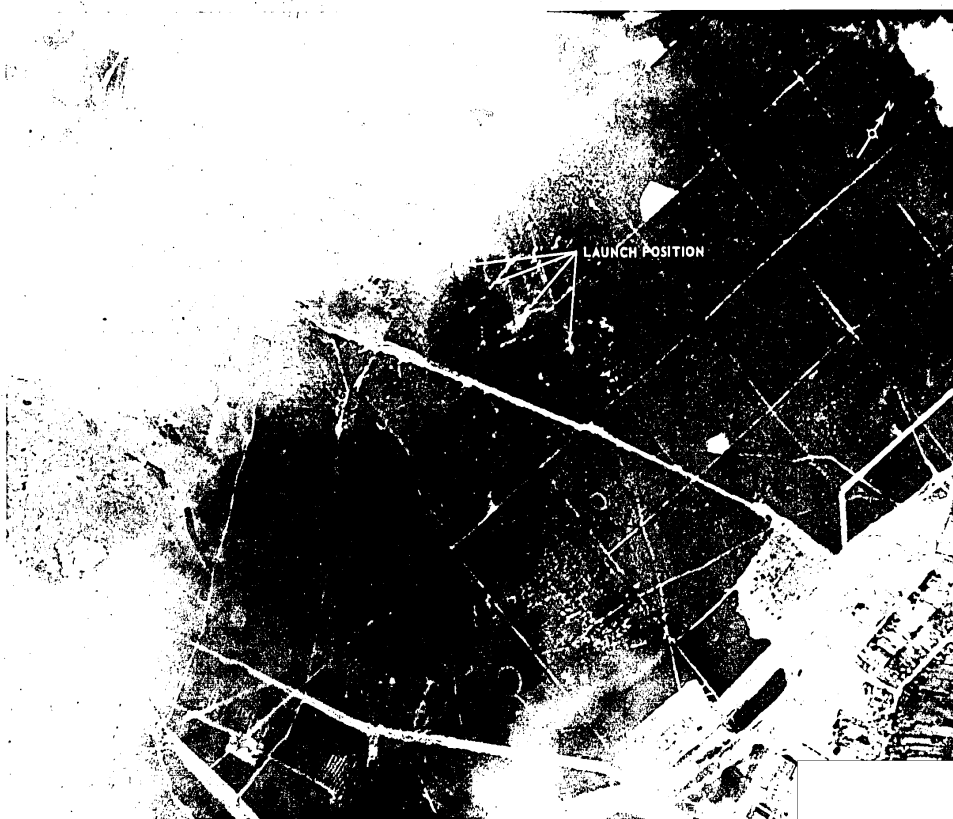


FIGURE 45. SOVIET NOSECONE VANS AT MRBM LAUNCH SITE IN CUBA.

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FIGURE 46. AKHTYRKA FIXED FIELD SITE, AKHTYRKA MRBM COMPLEX.

TOP SECRET CHESS RUFF

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TOP SECRET CHESS RUFF



FIGURE 47. ROZHDESTVENKA MRBM LAUNCH SITE.

APRIC 4-10-67 4-501

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TOP SECRET CHESS RUFF

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TOP SECRET CHESS RUFF



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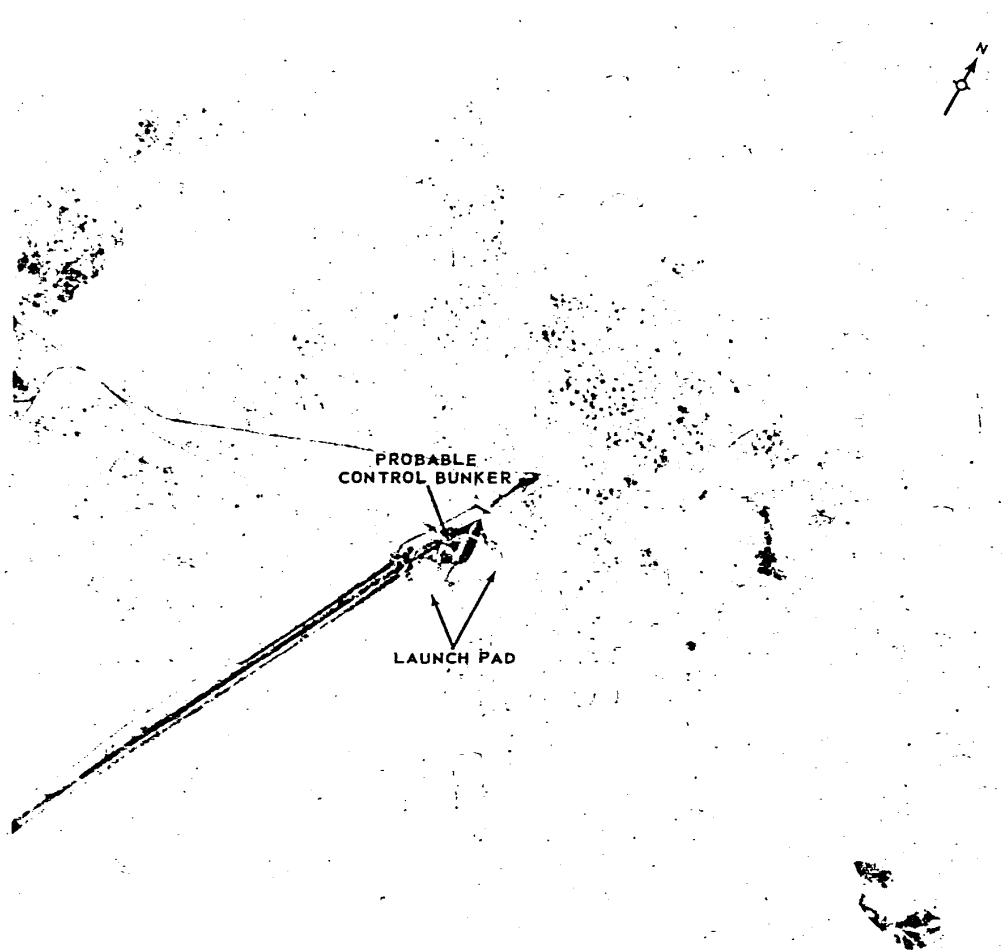


FIGURE 48. LAUNCH COMPLEX H, KAPUSTIN YAR.

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TOP SECRET CHESS RUFF



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TOP SECRET CHESS RUFF

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TABLE 1. SUMMARY OF ESTIMATED STATUS OF IDENTIFIED ICBM, IRBM, AND MRBM LAUNCHERS  
AT DEPLOYED COMPLEXES\*

Type	Sites	Launchers	Operational	U C	Type	Sites	Launchers	Operational	U C
ICBM					IRBM				
IA	3	4	4	0	III	15	58	58	0
IB	2	4	0	4	IV	18	54	51	3
IIA	5	10	10	0	TOTAL	33	112	109	3
IIB	29	58	58	0	MRBM				
IIC	7	14	14	0	I	84	336	336	0
IID	30	60	60	0	II	52	208	208	0
IIIA	23	69	69	0	IV	21	84	84	0
IIIB	3	9	9	0	TOTAL	157	628	628	0
IIIC	35	35	0	35	GRAND				
IIID	60	60	0	60	TOTAL	190	740	737	3
TOTAL	197	323	224	99					

\*See Tables 2, 3, and 4 for details. Figures include 3 launch silos at Type IIIA and IIIB ICBM and Type IV IRBM sites, and 4 launch silos at Type IV MRBM sites.

TOP SECRET CHESS RUFF

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TABLE 3. SUMMARY EVALUATION OF SOVIET ICBM DEPLOYMENT

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
AKTYUBINSK Launch Complex PETROVSKA	50-00-30N 56-58-00E	IV	3	Complete
BELOMORSK Launch Complex RAMOYE	61-25-45N 34-18-45E	III	4	Complete
FEDOROVKA Launch Complex TRAKTOVYY	53-25-15N 62-23-00E	III	4	Complete
GELLI Launch Complex KAKASHURA	42-38-45N 47-27-00E	IV	3	Complete
GELLI	42-26-30N 47-28-30E	IV	3	Complete
PARAUL	42-47-30N 47-23-00E	IV	3	Complete
GRANOV Launch Complex GRANOV 1	48-56-15N 29-30-45E	III	4	Complete
GRANOV 2	48-50-00N 29-28-45E	IV	3	Complete
KALNIK	48-59-30N 29-21-45E	IV	3	Complete
KROLEVETS Launch Complex KROLEVETS 1	51-36-45N 33-29-30E	III	4	Complete
KROLEVETS 2	51-40-45N 33-31-45E	III	4	Complete
BEREZA	51-43-45N 33-43-45E	III	2	Complete
LEBEDIN Launch Complex LEBEDIN 1	50-33-00N 34-25-45E	III	4	Complete
LEBEDIN 2	50-35-45N 34-21-30E	III	4	Complete
LEBEDIN 2	50-38-00N 34-27-30E	III	4	Complete
NIGRANDE Launch Complex NIGRANDE	56-31-00N 22-02-45E	III	4	Complete
SKRUDVA	56-35-30N 21-49-45E	IV	3	Complete
VAINODE	56-28-30N 21-50-45E	IV	3	Complete
NOVOSYVOYEKA Launch Complex NOVOSYVOYEKA 1	44-14-45N 133-26-45E	III	4	Complete
NOVOSYVOYEKA 2	44-07-45N 133-28-30E	IV	3	Complete
PERVOMAYSK Launch Complex KAMENYY MOST	47-58-00N 30-58-45E	IV	3	Complete
SEMEVOVKA 1	47-58-45N 30-59-00E	IV	3	Complete
SEMEVOVKA 2	47-53-30N 30-58-45E	IV	3	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 3. (Continued)

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
SARY OZEK Launch Complex				
KARA BABAI 1	44-32-00N 77-16-15E	III	1	Complete
KARA BABAI 2	44-31-00N 77-18-15E	IV	3	Complete
KARA BABAI 3	44-30-15N 77-11-15E	IV	3	Complete
SMORGON Launch Complex				
SMORGON 1	54-31-15N 26-17-30E	III	1	Complete
SMORGON 2	54-26-00N 26-18-30E	IV	3	Complete
SMORGON 3	54-36-15N 26-22-30E	III	1	Complete
TAYBOLVA Launch Complex				
TAYBOLVA 1	68-28-00N 33-15-30E	IV	3	Complete
TAYBOLVA 2	68-30-30N 33-23-15E	IV	3	Complete
TAYBOLVA 3	68-26-00N 33-29-15E	IV	3	Undetermined
ZHU RAVKA Launch Complex				
ZHU RAVKA	54-36-30N 76-39-15E	III	1	Complete

\*TDI site designators have been adopted for IRBM launch sites.

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 1. SUMMARY EVALUATION OF SOVIET ICBM DEPLOYMENT

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
AKHTYRKA Launch Complex				
AKHTYRKA 1	50 16 00N 31 50 15E	II	1	Complete
AKHTYRKA 2	50 22 00N 31 57 00E	II	1	Complete
VLKSE Launch Complex				
LEJASCIEMIS 1	57 21 00N 26 41 15E	II	1	Complete
RUSKI	57 25 15N 26 50 00E	II	1	Complete
LEJASCIEMIS 2	57 13 00N 26 33 30E	IV	1	Complete
ANASTASYEVKA Launch Complex				
ANASTASYEVKA 1	18 41 15N 125 37 15E	II	1	Complete
ANASTASYEVKA 2	18 45 15N 125 41 00E	II	1	Complete
BALTA Launch Complex				
BALTA 1	18 01 15N 29 31 00E	II	1	Complete
BALTA 2	18 07 00N 29 31 30E	II	1	Complete
BARANO ORENBURGSKOYE Launch Complex				
SOFIYE ALEKSEYEVSKOYE	44 06 15N 131 22 30E	I	1	Complete
BARANO ORENBURGSKOYE	44 29 15N 131 30 15E	I	1	Complete
BELOKOROVICH Launch Complex				
OLEVSK 1	51 08 15N 28 07 15E	I	1	Complete
OLEVSK 2	51 10 30N 27 59 30E	I	1	Complete
RUDNYA ZLOTINSKAYA	51 03 30N 28 07 30E	IV	1	Complete
BORSICHEV Launch Complex				
SKALA PODOLSKAYA 1	18 51 00N 26 08 30E	I	1	Complete
SKALA PODOLSKAYA 2	18 52 15N 26 03 30E	I	1	Complete
BREST Launch Complex				
BREST 1	51 18 15N 24 00 15E	II	1	Complete
BREST 2	51 51 15N 24 01 15E	II	1	Complete
BRODY Launch Complex				
BRODY 1	50 06 00N 25 12 15E	IV	1	Complete
BRODY 2	50 12 00N 25 06 00E	I	1	Complete
BERESTECHO	50 20 00N 25 05 30E	I	1	Complete
BYKHOF Launch Complex				
SLEDYUKI	53 11 30N 30 20 30E	II	1	Complete
DERAZHNYA Launch Complex				
DERAZHNYA 1	49 27 00N 27 26 30E	II	1	Complete
DERAZHNYA 2	49 26 15N 27 29 00E	II	1	Complete
KHIMELNITSKIY	49 24 15N 27 08 15E	IV	1	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 4. (Continued)

LOCATION*	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
DISNA Launch Complex				
DISNA	55-35-15N 28-16-00E	I	1	Complete
ZELKI	55-35-45N 28-21-30E	I	1	Complete
BORKOVICH	55-41-45N 28-27-00E	II	1	Complete
DOLINA Launch Complex				
DOLINA 1	49-03-20N 21-03-30E	I	1	Complete
DOLINA 2	49-06-15N 21-08-30E	I	1	Complete
BOLEKHIV	49-06-45N 23-51-15E	IV	1	Complete
DROGOBYCH Launch Complex				
MEDENITSIA	49-22-15N 23-45-30E	I	1	Complete
DROGOBYCH	48-25-30N 23-31-45E	I	1	Complete
STRYI	49-16-45N 23-43-00E	IV	1	Complete
DYATLOVO Launch Complex				
DYATLOVO	53-32-45N 25-16-45E	I	1	Complete
BEREZOVKA	53-35-50N 25-17-30E	I	1	Complete
ZBLIANY	53-35-45N 25-27-30E	II	1	Complete
GOMEI Launch Complex				
BORKHOV 1	52-18-30N 30-42-45E	II	1	Complete
BORKHOV 2	52-21-45N 30-39-00E	II	1	Complete
GRESK Launch Complex				
GRESK 1	53-14-15N 27-42-30E	I	1	Complete
GRESK 2	53-17-00N 27-40-45E	I	1	Complete
TREKHIVYE	53-11-00N 27-58-30E	II	1	Complete
GROZNYI Launch Complex				
STAZHENSKOYE	43-08-15N 44-51-15E	I	1	Complete
NESTEROVSKAYA	43-11-30N 44-57-00E	I	1	Complete
ACHKHIV-MARTAN	43-10-20N 45-10-30E	IV	1	Complete
GUSEV Launch Complex				
GUSEV 1	54-41-20N 22-05-00E	I	1	Complete
GUSEV 2	54-44-00N 22-03-30E	I	1	Complete
GVARDEYSK Launch Complex				
GVARDEYSK 1	54-40-30N 21-07-30E	I	1	Complete
GVARDEYSK 2	54-45-45N 21-09-15E	I	1	Complete
JELGAVA Launch Complex				
IECWA 1	56-35-30N 24-04-00E	II	1	Complete
IECWA 2	56-39-45N 24-07-30E	II	1	Complete
IECWA 3	56-33-00N 24-20-30E	IV	1	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 4. (Continued)

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
JONAVA Launch Complex				
KARMEJAVA	54-57-15N 24-05-45E	II	1	Complete
JONAVA	55-01-00N 24-11-15E	II	1	Complete
KAMENETS-PODOLSKIY Launch Complex				
KAMENETS-PODOLSKIY	48-51-15N 26-42-30E	II	1	Complete
DUNAVEVTSY	48-55-15N 26-59-00E	II	1	Complete
KIVERTSY Launch Complex				
KIVERTSY 1	50-53-15N 25-31-00E	I	1	Complete
KIVERTSY 2	50-56-00N 25-36-15E	I	1	Complete
TROSTYANETS	50-58-30N 25-39-30E	II	1	Complete
KONKOVICH Launch Complex				
PETRIKOV	52-40-30N 28-31-45E	I	1	Complete
KONKOVICH	52-45-30N 28-37-15E	I	1	Complete
KOROSTEN Launch Complex				
KOROSTEN 1	50-51-15N 28-18-15E	II	1	Complete
KOROSTEN 2	50-52-15N 28-31-00E	II	1	Complete
KOZHANOVICH Launch Complex				
KOZHANOVICH 1	52-10-15N 27-51-30E	I	1	Complete
KOZHANOVICH 2	52-11-30N 27-48-00E	I	1	Complete
KRASKINO Launch Complex				
KRASKINO	42-11-00N 43-10-45E	II	1	Complete
KRASNOYAMENSK Launch Complex				
VIESVILLE	55-01-30N 22-23-00E	I	1	Complete
RAGNIE	55-01-15N 22-11-15E	I	1	Complete
KREMOVO Launch Complex				
KREMOVO	44-01-24N 43-20-30E	I	1	Complete
LALICH	44-02-30N 43-26-20E	I	1	Complete
KURGANCH Launch Complex				
KURGANCH 1	39-37-15N 65-57-30E	I	1	Complete
KURGANCH 2	39-37-30N 65-57-00E	I	1	Complete
TYM	39-35-15N 65-42-15E	IV	1	Complete
LIDA Launch Complex				
LIDA 1	53-47-30N 25-20-30E	I	1	Complete
LIDA 2	53-47-15N 25-27-15E	I	1	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 4. (Continued)

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
LUTSK Launch Complex				
LUTSK 1	50-46-15N 25-03-00E	I	1	Complete
LUTSK 2	50-50-30N 25-01-15E	I	1	Complete
VLADIMIR-VOLYNSKIY	50-18-30N 24-42-30E	IV	1	Complete
MARINA GORKA Launch Complex				
MARINA GORKA	53-26-30N 27-15-30E	II	1	Complete
MAYKOP Launch Complex				
KURDZHIPSKAYA	44-31-15N 40-00-15E	II	1	Complete
SHIRVANSKAYA	44-25-30N 39-51-00E	IV	1	Complete
MOLOSKOVITSY Launch Complex				
MOLOSKOVITSY 1	50-28-15N 29-06-00E	II	1	Complete
MOLOSKOVITSY 2	50-29-30N 29-12-15E	II	1	Complete
GRILEVO	50-25-00N 28-53-15E	IV	1	Complete
MUKACHEVO Launch Complex				
MUKACHEVO 1	48-18-15N 22-30-15E	I	1	Complete
MUKACHEVO 2	48-19-30N 22-37-15E	I	1	Complete
NADVORNAYA Launch Complex				
PARYSHCHE	48-37-15N 24-42-00E	I	1	Complete
NOVAYES	48-39-30N 24-18-15E	I	1	Complete
OTYNA	48-17-30N 24-50-30E	IV	1	Complete
OSTROG Launch Complex				
OSTROG 1	50-14-00N 26-48-15E	I	1	Complete
OSTROG 2	50-17-15N 26-41-00E	I	1	Complete
OSTROY Launch Complex				
ASANOV-SICHINA	57-31-15N 28-12-15E	I	1	Complete
SHEVELEVO	57-37-00N 28-12-15E	I	1	Complete
REDKINO	57-24-30N 28-26-00E	IV	1	Complete
PAPLAKA Launch Complex				
PAPLAKA 1	56-24-00N 21-17-30E	I	1	Complete
PAPLAKA 2	56-25-00N 21-16-15E	I	1	Complete
PINSK Launch Complex				
IVANOYO	52-10-15N 25-11-15E	I	1	Complete
MOTOL	52-12-30N 25-11-30E	I	1	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 1. (Continued)

LOCATION	COORDINATES	TYPE	NO OF PADS 4 MANCHERS	ESTIMATED CONSTR STATUS 1 MAR 1965
POLOTSK Launch Complex				
POLOTSK 1	55 22 30N 28 41 30E	II	1	Complete
POLOTSK 2	55 21 15N 28 43 15E	II	1	Complete
POSTAVY Launch Complex				
POSTAVY 1	55 09 15N 26 53 15E	II	1	Complete
KOZIANY	55 20 30N 26 51 30E	II	1	Complete
POSTAVY 2	55 06 15N 27 00 15E	IV	1	Complete
PRIZHANSKY Launch Complex				
PRIZHANSKY 1	52 30 30N 21 08 15E	II	1	Complete
PRIZHANSKY 2	52 33 30N 21 06 15E	II	1	Complete
RAKERE Launch Complex				
RAKERE	59 08 15N 26 26 15E	II	1	Complete
VAIKE MARMJA	59 11 15N 26 20 15E	II	1	Complete
RISTE Launch Complex				
RISTE 1	59 04 00N 21 04 30E	I	1	Complete
RISTE 2	59 07 15N 21 06 15E	I	1	Complete
RUZHANSKY Launch Complex				
KRUPA 1	52 47 15N 21 42 30E	II	1	Complete
KRUPA 2	52 49 15N 21 45 30E	II	1	Complete
SATEKIAL Launch Complex				
SALANTAI 1	55 59 15N 24 38 15E	I	1	Complete
SALANTAI 2	56 02 15N 24 40 30E	I	1	Complete
ZEMNICH KALABRJA	56 01 15N 24 51 30E	IV	1	Complete
SMERODPOL Launch Complex				
MAZANKA	44 53 45N 34 20 00E	I	1	Complete
VALKI	44 57 00N 34 26 00E	I	1	Complete
SLOVIN Launch Complex				
BYTEN 1	52 52 30N 25 21 30E	I	1	Complete
BYTEN 2	52 55 45N 25 22 15E	I	1	Complete
SOKAL Launch Complex				
SOKAL 1	50 22 45N 24 18 15E	I	1	Complete
SOKAL 2	50 27 15N 24 20 00E	I	1	Complete
SOKAL 3	50 20 15N 24 26 15E	IV	1	Complete

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

TABLE 1. (Continued)

LOCATION	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS: 1 MAR 1965
SOVETSK Launch Complex				
SLAVSK 1	51 59 15N 21 26 30E	I	1	Complete
SLAVSK 2	51 59 15N 21 28 30E	I	1	Complete
SLUCHIN Launch Complex				
NOVITSKOYE	43 01 45N 133 17 00E	I	1	Complete
SEVERNY SLUCHIN	43 10 00N 133 20 05E	I	1	Complete
TAURAGE Launch Complex				
TAURAGE 1	55 10 15N 22 20 30E	I	1	Complete
TAURAGE 2	55 05 00N 22 20 00E	I	1	Complete
TORVA Launch Complex				
TORVA 1	57 56 00N 26 01 00E	I	1	Complete
TORVA 2	57 59 15N 26 05 00E	I	1	Complete
TSHIGLINA	57 19 45N 26 12 30E	IV	1	Complete
UGOLNYY Launch Complex				
UGOLNYY	61 17 32N 177 56 15E	II	1	Complete
UKMERGE Launch Complex				
VEPRAI	55 07 15N 21 38 30E	I	1	Complete
UKMERGE	55 11 00N 21 42 30E	I	1	Complete
UMAN Launch Complex				
MOLODETSKOYE	48 53 15N 30 27 15E	I	1	Complete
MYKOVKA	48 57 15N 30 23 15E	I	1	Complete
KISHENTSY	49 00 15N 30 43 15E	IV	1	Complete
USOVO Launch Complex				
OVRI CH 1	51 17 15N 28 16 15E	I	1	Complete
OVRI CH 2	51 18 30N 28 10 30E	I	1	Complete
LIPNIKI	51 12 15N 28 26 30E	II	1	Complete
UZHGOROD Launch Complex				
UZHGOROD	48 33 30N 22 43 15E	II	1	Complete
VORI Launch Complex				
VORI 1	57 16 00N 26 17 15E	II	1	Complete
VORI 2	57 19 00N 26 50 30E	II	1	Complete
ASELYUB Launch Complex				
ASELYUB 1	55 15 15N 25 13 00E	I	1	Complete
ASELYUB 2	55 18 00N 25 16 15E	I	1	Complete

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TOP SECRET CHESS RUFF

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TABLE 1. *(Continued)*

LOCATION*	COORDINATES	TYPE	NO OF PADS LAUNCHERS	ESTIMATED CONSTR STATUS 1 JAN 1965
YELSK Launch Complex				
YELSK 1	51 42 30N 29 12 30E	I	1	Complete
YELSK 2	51 47 15N 29 18 15E	I	1	Complete
ZAGARE Launch Complex				
ZAGARE 1	56 22 15N 23 19 15E	I	1	Complete
ZAGARE 2	56 29 00N 23 20 15E	I	1	Complete
LIELELEJA	56 24 20N 23 36 15E	IV	1	Complete
ZHITOMIR Launch Complex				
ZHITOMIR 1	40 04 15N 28 45 45E	II	1	Complete
ZHITOMIR 2	40 10 00N 28 16 15E	II	1	Complete
BERDICHAY	40 05 20N 28 22 00E	II	1	Complete
ZHMERINKA Launch Complex				
GNIYAN	49 00 00N 28 47 15E	II	1	Complete
ZHMERINKA	49 10 15N 28 05 00E	II	1	Complete
VINITSYA	49 17 30N 28 20 15E	IV	1	Complete
ZNAMENSK Launch Complex				
ZNAMENSK 1	54 52 15N 21 41 15E	I	1	Complete
ZNAMENSK 2	54 55 15N 21 07 30E	I	1	Complete

\*TDL site designations have been adopted for MIRBM Launch sites.

TOP SECRET CHESS RUFF

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TABLE 6. SUMMARY EVALUATION OF SOVIET FIXED FIELD SITES (SSM FIXED FIELD POSITIONS)

LOCATION	COORDINATES	NO OF LAUNCH POSITIONS
AKHTYRKA Akhtyrka	50-19-30N 34-51-30E	1
ALUKSNE Lejasciems	57-15-15N 26-11-15E	1
ANASTASYEVA Anastas'yevka	48-32-15N 135-31-15E	1
BELOKOROVICHI Rudnya Zlotn'skaya	51-08-30N 27-59-15E	1
BREST Pishcha Zamshany	51-35-15N 25-16-15E 51-50-05N 24-02-05E	1 1
BRODY Yazlovchik Stani-slavchik	50-05-15N 25-02-00E 50-07-00N 24-56-30E	1 1
DERAZHNYA Khmel'nitskiy Letichev 1 Letichev 2	49-25-00N 27-06-30E 49-22-15N 27-13-15E 49-25-15N 27-15-00E	2 1 2
DISNA Dernovichi	55-17-15N 28-20-00E	1
DOLINA Berezhnitsa Rukuv	49-12-45N 23-57-30E 48-58-21N 24-05-35E	1 1
DYATLOVO Ruda Yavor'skaya 1 Ruda Yavor'skaya 2 Ruda Yavor'skaya 3	53-23-15N 25-10-30E 53-23-15N 25-12-15E 53-23-15N 25-13-30E	1 1 1 1 1 1
GOMEL Gomel	52-29-15N 30-51-30E	1
GUSEV Tolminkemsk	51-22-15N 22-20-15E	1

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 6. (Continued)

LOCATION*	COORDINATES	NO OF LAUNCH POSITIONS
GVARDEYSK Gorovskoye	54-43-45N 24-25-45E	2
Vysokoye	54-44-30N 24-33-45E	1
JELGAVA		
Jelgava 1	56-38-45N 23-52-45E	2
Jelgava 2	56-44-15N 23-53-45E	1
JONAVA		
Kau-nadorys	54-59-30N 24-29-00E	1
KAMENETS-PODOLSKIY		
Yarmolinty	49-42-00N 26-46-45E	1
KIVERTSY		
Kivertsy	50-56-00N 25-25-00E	1
KONKOVICHI		
Novoselki 1	52-23-00N 28-42-45E	1
Novoselki 2	52-23-45N 28-41-00E	1
KOROSTEN		
Lutki 1	51-01-30N 28-27-45E	1
Yemlechino 1	50-52-30N 27-53-00E	1
Yemlechino 2	50-52-00N 27-53-00E	1
Lutki 2	51-01-45N 28-24-45E	2
KRASNOZNAMENSK		
Krasnoznamensk	54-57-30N 22-35-00E	1
Sudargi	55-00-30N 22-35-00E	1
KIREMOVO		
Manzovka	44-42-00N 43-34-00E	4
LIDA		
Vasilivki	53-44-00N 24-56-45E	1
LUTSK		
Gorokhov	50-33-45N 24-48-45E	1
MARINA GORKA		
Shotki	53-27-45N 27-48-00E	1
MAYKOP		
Talskaya	49-31-45N 40-44-45E	1
Maykop	44-32-30N 39-57-45E	1

TOP SECRET CHESS RUFF

TOP SECRET CHESS RUFF

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TABLE 6. (Continued)

LOCATION*	COORDINATES	NO OF LAUNCH POSITIONS
NADVORNAYA Ramovtsy	48-28-00N 24-54-15E	1
OSTROG Slavuta	50-16-15N 26-57-15E	2
Shepotyvska	50-12-30N 26-59-00E	1
OSTROV Shahuny	57-23-15N 28-13-15E	1
PINSK Lyckkovtsy	52-15-00N 25-21-15E	4
POLOTSK Plissa 1	55-12-30N 28-01-15E	3
Plissa 2	55-11-30N 27-54-15E	1
POSTAVY Sivitsy	55-09-30N 26-53-15E	1
Bagatoye	54-57-15N 26-28-15E	1
Kobyluk	54-56-30N 26-37-15E	4
PRUZHANY Strigovo	53-23-15N 24-14-30E	1
Shecherby	52-23-00N 24-10-00E	1
RUZHANY Shechimo 1	52-13-15N 24-58-15E	1
Shechimo 2	52-11-00N 24-57-30E	1
SATEIKIV Tel'siai	55-56-15N 22-07-00E	1
Al'selzina	56-00-15N 22-06-00E	1
SLOXIM Byton	52-54-30N 25-22-00E	2
SMORGON Smorgon	54-34-15N 26-21-30E	2
TAURAGE Skaidvile	55-23-00N 22-31-00E	1
Taurage	55-10-00N 22-11-30E	2

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TABLE 6, (Continued)

LOCATION*	COORDINATES	NO OF LAUNCH POSITIONS
TORVA Valga	57-50-15N 25-51-15E	1
UKMERGE Gelyonki Balminkai	55-07-15N 24-43-45E 55-13-00N 25-02-00E	1 1
USOVO Luginy	51-08-00N 28-23-00E	1
VELSK Yel'sk	51-50-45N 29-05-15E	1
ZAGARE Dobele 1 Dobele 2	56-10-00N 23-11-45E 56-10-45N 23-06-15E	1 1
ZHITOMIR Berdichev	49-51-30N 28-25-30E	2
ZHMERINKA Vinitsa Bar	49-13-15N 28-48-45E 49-05-30N 27-43-00E	1 1
ZNAMENSK Pravdin'sk Domnovo	51-23-00N 20-59-15E 51-25-30N 20-53-00E	3 1

\*TDI site designators have been adopted for the fixed field sites, which are listed under the nearest permanent IRBM MRBM complex.

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TABLE 7. COMPOSITION OF IRBM MRBM COMPLEXES

No of Complexes	Containing Soft Sites Only				Containing Hard Sites Only			Containing Hard and Soft Sites		
	One Site, No Housing or Support Facility	One Site	Two Sites	Three Sites	One Site	Two Sites	Three Sites	Two Soft One Hard Site	One Soft One Hard Site	One Soft Two Hard Sites
IRBM	3									
	2									
	3			2				1	1	3
	4				1		3			
MRBM										
	4									
	4									
	13	1	36	6						
	21							20	1	
TOTALS	82	7	1	36	8	1	3	21	2	3

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Table 8. Soviet ICBM, IRBM, and MRBM Systems, Estimated Technical Characteristics and Performance

	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10 1/
Initial operational capability (IOC)	Late 1958	Late 1961	1960	Early 1962 (soft) Early 1963 (hard)	Mid-1963 (soft) Mid-1964 (hard)	1965	Undetermined
Nominal maximum range 2/ (NRL, non-rotating earth)	1,020 nm	2,200 nm	6,000 nm	6,000 nm	6,000 nm	6,000 nm	Undetermined
Guidance	Inertial	Inertial	Radio inertial	Inertial	Radio inertial	Radio inertial	Undetermined
Circular error probability (CEP)							
Initial	1.25 nm	1.0 nm	2.0 nm	1-2 nm	1.0 nm	0.5-1.0 nm	Undetermined
Improved/year	--	--	--	1.0/1966	0.8/1967	0.5/1968-1970	Undetermined
Re-entry vehicle weight (lbs)	3,200, ± 500	2,500-4,000	8,000, ± 1,000	3,000-4,000 4/	2,500-4,000	10,000, ± 1,000	Undetermined
Warhead weight (lbs)	2,000, ± 300	2,000-3,200	6,000, ± 1,000	2,400-3,200	2,000-3,200	8,000, ± 1,000	Undetermined
Gross lift-off weight (lbs)	88,000 (approx)	200,000 (approx)	500,000 (approx)	300,000 (approx)	165,000 (approx)	400,000 (approx)	Undetermined
Configuration	Single-stage	Single-stage	Parallel	Tandem 2-stage	Tandem 2-stage	Tandem 2-stage	Undetermined
Propellant	Storable liquid	Storable liquid	Non-storable liquid	Storable liquid	Non-storable liquid	Storable liquid	Undetermined
Reliability rates: 5/							
Ready-missile	80%	80%	80%	80%	80%	80%	Undetermined
Countdown							
Initial	90%	85%	85%	85%	85%	80%	Undetermined
Improved/year	--	--	--	--	--	85%/1967	Undetermined
Inflight							
Initial	85%	90%	85%	90%	90%	85%	Undetermined
Improved/year	--	--	--	--	--	90%/1967	Undetermined
Overall							
Initial	60% (soft) 65% (hard)	60% (soft) 65% (hard)	60%	60%	60%	55%	Undetermined
Improved/year	--	--	--	--	--	60%/1967	Undetermined

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Table 8. (Continued)

	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10 <sup>1/</sup>
Reaction time from ready condition: <sup>6/</sup>							
Condition 3	1-3 hrs	1-3 hrs	12 hrs (minimum)	1-3 hrs	1-3 hrs	1-3 hrs	Undetermined
Condition 2	15-30 min	15-30 min	1-2 hrs	15-30 min	30-45 min	15-30 min	Undetermined
Condition 1	5-15 min	5-15 min	5-15 min	5-15 min	5-15 min	5-15 min	Undetermined
Hold time in ready condition 1 <sup>7/</sup>	hrs-days	hrs-days	1 hr	hrs (soft) - days (hard)	1 hr (approx)	hrs (soft) - days (hard)	Undetermined
Refire time <sup>8/</sup>	2-4 hrs	2-4 hrs	12 hrs (minimum)	2-4 hrs	2-4 hrs	2-4 hrs	Undetermined

<sup>1/</sup> The evidence is insufficient to enable us to make an estimate of SS-10 characteristics and performance.

<sup>2/</sup> Operational range is dependent on weight class of payload used.

<sup>3/</sup> It is believed that the SS-9 has an additional all-inertial guidance capability with a CEP of 1-1.5 nm.

<sup>4/</sup> More than one re-entry vehicle exists within these limits. Another, weighing as much as approx. 5,000 lbs (warhead 4,000 lbs) has been tested to a reduced range (4,700 nm).

<sup>5/</sup> These reliability rates may be too high since they may not sufficiently take into account the effect of Soviet operational methods and troop training, which are at least as important as technical characteristics in determining system reliability. We have little basis for estimating these effects.

<sup>6/</sup> Readiness Condition 3 is believed to be the normal readiness condition for missiles deployed at soft sites, and Condition 2 for hard sites.

<sup>7/</sup> An unfavorable environment could seriously degrade these hold times. Because of the protection afforded a missile in a hardened site, it is given a longer hold time than its soft counterpart. We believe the cryogenic properties of non-storable propellants probably limit these missiles to a hold time of about 1 hour.

<sup>8/</sup> Refire capabilities are applicable to soft sites only. Estimated refire times are based on the assumption that the launch sites were designed specifically for an efficient refire capability and that no major refurbishment of ground support equipment or launch stand is necessary.

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